

LG CodePlus OAT100R Warranty



Broadcast Products Welcome to the LG family! We believe that you will be pleased with your new CodePlus OAT100R Off Air Transcoder System. Please read this warranty carefully, it is a "LIMITED WARRANTY" as defined under Federal Law. This warranty gives you specific legal rights, and you may also have other rights that vary from state-to-state within the U.S.A.

LG's RESPONSIBILITY

Warranty Term	One year parts and labor from date of purchase or delivery date.
Parts	New or remanufactured replacements for factory-defective parts may be used. Such replacement parts are warranted for the remaining portion of the original warranty period.
Warranty Service	Warranty service is provided at LG. Customer pays for shipping charges to LG; LG pays for return shipping charges to return the OAT100R to customer. Call 1-888-865-3026 for further information.
Not Covered	This warranty covers manufacturing defects and does not cover installation, adjustment of customer controls, installation or repair of antenna systems, cable converters or cable company-supplied equipment; it also does not cover damage due to misuse, abuse, negligence, acts of God or other causes beyond the control of LG. Any alteration of the product after manufacture voids this warranty in its entirety. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND LG SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, OR INCIDENTAL DAMAGES OF ANY KIND, INCLUDING LOST REVENUES OR PROFITS IN CONNECTION WITH THIS PRODUCT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

OWNER'S RESPONSIBILITY

Effective Warranty Date	Warranty begins on the date of delivery of the OAT100R. For your convenience, keep the dealer's dated bill of sale or delivery ticket as evidence of the purchase date.
Installation Guide	Read the Installation & Setup Guide carefully so that you will understand the operation of the OAT100R and how to adjust the settings.
Warranty Service	For warranty service information, call 1-888-865-3026. Parts and service labor that are LG's responsibility (see above) will be provided without charge. Other service is at the owner's expense. If you have any problem in obtaining satisfactory warranty service, call 1-888-865-3026 . You must provide the model number, serial number and date of purchase or date of original installation.

For Customer Support/Service, please call:

1-888-865-3026

www.LGsolutions.com


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CodePlus™ OAT100R Off Air Transcoder System

Installation & Setup Quick Reference | Warranty

The latest product information and documentation is available online at:
www.LGsolutions.com






WARNING

RISK OF ELECTRIC SHOCK

DO NOT OPEN



WARNING:

TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

L'appareil ne doit pas être exposé à des égouttements d'eau ou des éclaboussures et de plus qu'aucun objet rempli de liquide tel que des vases ne doit être placé sur l'appareil.

WARNING:

This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. ***Wash hands after handling.***

REGULATORY INFORMATION:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user should be required to correct the interference at his own expense.

CAUTION:

Do not attempt to modify this product in any way without written authorization from LG Electronics U.S.A., Inc. Unauthorized modification could void the user's authority to operate this product.

COMPLIANCE:

The responsible party for this product's compliance is: LG Electronics U.S.A., Inc.
2000 Millbrook Drive, Lincolnshire, IL 60069, USA • Phone: 1-847-941-8000

Product Type	Off Air Transcoder System
Model Number/Range	OAT100R

Those products identified by the Product Type and Model Range above from LG Electronics, Inc. ("LGE") contain the open source software detailed below. Please refer to the indicated open source licences for the terms and conditions of their use.

Components	License
bash, busybox, das u-boot, e2fsprogs, ethtool, gawk, i2c-cores, iptables, linux kernel, lrzsz, lzo, mtd-utils, net-tools, ntpclient, openvpn, pciutils, ppp, procp, screen, skell, time	GPL 2.0
eglibc, libelf, termcap	LGPL 2.0/2.1

The source code and other important information for the above may be obtained free of charge from LGE at <http://opensource.lge.com>. LGE will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping and handling) upon e-mail request to opensource@lge.com. This offer is valid for three (3) years from the date on which you purchased the product.

Please be informed that LG Electronics products may contain open source software listed in the table below.

Components	License
openssh	OpenSSH License
OpenSSL	OpenSSL License
sudo	sudo License

Dimensions

Height:	1.692 inches (42.977 mm)
Width:	19.0 inches (482.6 mm) with mounting brackets attached (for EIA standard 19-inch rack mount)
Depth:	8.5 inches (215.9 mm)
Weight:	4.45 pounds (2.02 kgms) rack-only weight

Environmental Storage Conditions

Temperature:	-20° to 70° Celsius -4° to 158° Fahrenheit
Humidity:	95% non-condensing


Environmental Operating Conditions

Temperature (Tma):	0° to 40° Celsius 32° to 104° Fahrenheit
Humidity:	95% non-condensing

Electrical

RF Out Connector:	Type 'F'
RF Output Span:	4 Contiguous Channels (typically 24 MHz)
RF Output Frequency Range:	54 MHz to 864 MHz
Active Output Level at RF Out jack:	-6 dBm (+42 dBmV) Min.
RF IN Ports (8):	Type 'F', 75 Ohm
RF Input Frequency Range:	Terrestrial Channels 2 to 69
RF Input Signal Level:	+3 dBm (+52 dBmV) to -83 dBm (-34 dBmV)
RF Input Signal-to-Noise Ratio:	>17 dB
DC Input:	+12V DC @ 2.6 Amps
Ethernet Connector (Control Port):	10/100/1000BaseT, RJ-45
Ethernet Connector (Feature Port):	1000BaseT Full Duplex, RJ-45
USB Port:	USB 2.0

Note: Design and specifications subject to change without prior notice.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources, such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination in order to avoid injury from tip-over.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. **Power Sources**
This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your INSTALLATION, consult your product dealer or local power company.
15. **Overloading**
Do not overload wall power outlets and extension cords as this can result in a risk of fire or electric shock.
16. **Disconnect Device**
The AC mains plug is used as the disconnect device. The disconnect device must remain readily operable.
17. **Object and Liquid Entry**
Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product. Do not use liquid cleaners or aerosol cleaners.
18. **Outdoor Use**
 **Warning: To prevent fire or shock hazards, do not expose this product to rain or moisture.**
19. **Wet Location**
Do not use this product near water or moisture or in an area, such as a basement, that might become flooded. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
20. **Test Equipment**
In some cases, LG has supplied or recommended the use of test equipment and devices for the setup and testing of the equipment. The operation and maintenance of test equipment is described in their associated instruction manuals. Please refer to these manuals for explicit instructions regarding the safe use and handling of the equipment.

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21. Damage Requiring Service

Unplug this product from the wall power outlet and refer servicing to qualified service personnel under the following conditions:

- a. If the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or the cabinet has been damaged.
- f. If the product exhibits a distinct change in performance.



Caution: Refer all servicing to qualified service personnel.

22. Servicing



Caution: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electrical shock, do not perform any servicing other than that described in the operating instructions unless you are qualified to do so.

23. Replacement Parts

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

24. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

This section provides introductory OAT100R installation and setup troubleshooting information. Refer to the extended Installation & Setup Guide for additional troubleshooting information.

Equipment Setup Review

- Make sure all connectors and connections are tight and secure on all entertainment system components.
- Check the OAT100R PWR LED. Under standard operating conditions the PWR (Power) LED on the OAT100R front panel is continuously lit green. If there is a hardware fault, the PWR LED will turn and stay red.
Note: When power is first applied to the OAT100R, the PWR LED initially flashes red and then turns green.
- Check the OAT100R STATUS LED. When the OAT100R is booted and operating normally, the STATUS LED is continuously lit green.

Network Setup

If the network is configured for DHCP but the OAT100R has not been assigned an IP address, i.e., the Ctrl IP field in the OAT100R System Information display is blank:

1. Check the Control Port connector on the rear panel of the OAT100R. Make sure the cable connection is tight and secure.
2. Observe the green LED on the Control Port. Once the OAT100R is connected to the network, the LED will be lit continuously.
3. Contact the network administrator to verify the network status and check that the DHCP server is working properly.

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25. Repeat steps 23 and 24 for each tuner being used.

Note: Use the “tuner” command to access the Tuner Menu for each of the tuners in turn; i.e., at the `Tuner Command >` prompt, type **tuner** and press **Enter**. Then, at the `Enter Tuner number [#]>` prompt, type the number of the next OAT100R RF IN port/tuner and press **Enter**. The system will identify the (newly) current tuner and then display a tuner command prompt.

26. If you changed the Control Port configuration (see step 14) and you have not yet reset the system, type **exit** and press **Enter** to return to the Main Menu `Command >` prompt. Then, reset the system as follows:

- At the `Command >` prompt, type **reset** and press **Enter**.
- At the prompt for confirmation, type **y** and press **Enter**.

The reset process, during which each of the tuners will also be reinitialized, may take up to two minutes, after which the system resumes normal operation.

27. Check one or more room receivers to make sure all content is properly mapped and available.

OAT100R Rack Installation

(also see pages 11 and 12)

To install the OAT100R in a rack:

- Carefully slide the OAT100R into a standard 19-inch equipment rack.
- When mounting in the rack, make sure to use the appropriate hardware. ALL FOUR MOUNTING SCREWS MUST BE USED.
- This equipment is not designed to support other devices. Do NOT stack other equipment on the top of the OAT100R.
- Rear cabling must be dressed and supported so that the weight of the cabling is not a strain on the OAT100R connectors.
- MOUNTING OF THE EQUIPMENT IN THE RACK SHOULD BE SUCH THAT A HAZARDOUS CONDITION IS NOT ACHIEVED DUE TO UNEVEN MECHANICAL LOADING.

Rack-mount Considerations

A. Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer (see Specifications information in this document).

B. Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the OAT100R. Do NOT stack other equipment on the top of the OAT100R. Also, ensure that the unit's AC power adapter is never stacked or bundled with other AC power adapters. Each adapter should have adequate ventilation and should be isolated from other heat sources.

C. Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring.

D. Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

E. Mains Outlet Earthing

The apparatus with Class I construction must be connected to a mains socket outlet with a protective earthing connection.

The LG CodePlus™ OAT100R Off Air Transcoder System provides a flexible solution for system providers who provide terrestrial delivered DTV content to commercial facilities (hotels, hospitals, etc.). The OAT100R incorporates eight RF tuners that receive up to eight off air DTV channels from the terrestrial broadcast service.

Features

- Transcodes broadcast DTV content for distribution on SMATV or IPTV network
- Two output options: either RF or IP
 - RF output: The OAT100R generates four contiguous 256-QAM or 64-QAM cable channels. With 256-QAM output, up to two broadcast channels are multiplexed on each QAM channel, with support for up to eight programs per tuner input. This capability provides output of up to 64 programs. With 64-QAM output, one broadcast channel is multiplexed on each QAM channel, with support for up to eight programs per tuner input. This capability provides output of up to 32 programs.
 - IP output: The OAT100R provides up to eight multicast streams with support for up to eight programs each if provided in the original broadcast.
- Provides one MPEG-2 video output with up to two AC3 audio outputs per program
- Supports any QAM compatible television
- Transcoded output supports Closed Captions and V-Chip (Parental Control) (if included in the signal source)
- Remote management capability over Ethernet via either graphical user interface (GUI) or command line interface
- Small, lightweight chassis
- 19-inch rack-mountable
- 1U height profile to minimize rack space usage

The OAT100R converts terrestrial DTV programming to a groomed, multiplexed transport stream that is compatible with any digital television that supports QAM tuning.

Note: LG PIVD100R (Pro:Idiom® Video Distribution) and OAT100R units may be combined in the head end to deliver an entire channel lineup of digital programming.

Note: Design and specifications subject to change without prior notice.

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- c) At the `Tuner Command >` prompt, type **prog** and press **Enter**. The system displays the current program configuration and then displays the first of a series of prompts for each input program:

Select input program 1 (use 0 for NC) [#]:

Note: Below the initial Current Program Selection list, the display identifies the programs that are available for the selected tuner/channel.

Note: When you set the tuner channel, the system automatically assigns the program inputs in numerical order (up to 8 programs). This will be reflected in the initial program configuration display. This command enables you to change the program order as desired.

- d) Either press **Enter** to accept the default value in square brackets, type **0** and press **Enter** to specify “no connection,” or type in a new program number and press **Enter**.

After you enter input program 1, the system will prompt for input program 2, then input program 3, then input program 4, etc. Specify the appropriate value for each of the input program prompts.

Once you specify the last input program, the system will display the new program configuration and prompt for confirmation, for example:

Do you want to save the new configuration? [y/n]:

- e) Review the program configuration to ensure it is correct, and then type **y** and press **Enter**.

24. At the next `Tuner Command >` prompt, type **info** and press **Enter**, and then check the following fields in the Tuner Information display:

- SNR: To avoid interference, the signal-to-noise ratio should be greater than 18.
- FEC Errors: There should be zero (0) forward error correction (FEC) errors.
- Signal Locked: The tuner should be locked to the antenna signal.

If any of these fields shows a value that is NOT in accordance with the specifications above, refer to “Receiver Reception” troubleshooting information in the extended Installation & Setup Guide.

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- a) If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
- b) At the `Setup Command >` prompt, type **scan** and press **Enter**. At the prompt for confirmation, type **y** and press **Enter** to continue.
- c) At the `Enter tuner for VHF scan [1] >` and `Enter tuner for UHF scan [1] >` prompts, either press **Enter** to accept the default value in square brackets, or type the appropriate tuner number and press **Enter**.

Note that an RF scan takes several minutes. When a scan is complete, the system will provide a listing of the available channels on the selected tuner(s) as well as the program(s) available for each of those channels.

Repeat this step for additional tuners as necessary; if multiple tuners are connected to one antenna, you do not need to run separate RF scans on each. Make note of the results, and then continue with step 20.

20. If the `Setup Command >` prompt is on display, type **exit** and press **Enter** to return to the `Command >` prompt.
21. At the `Command >` prompt, type **tuner** and press **Enter** to access the Tuner Menu. The next series of steps will guide you through the process of setting the channel and program numbers and verifying the configuration for each tuner.
22. At the `Enter Tuner number >` prompt, type the number of the first OAT100R RF IN port/tuner to configure. Then, press **Enter**.

The system will identify the current tuner and then display a tuner command prompt, for example:

```
Current Tuner: Tuner-1
Tuner-1 Command >
```

23. Set the tuner channel and program(s) as follows:
 - a) At the `Tuner Command >` prompt, type **channel** and press **Enter**.
 - b) At the `Enter channel [#]>` prompt, either press **Enter** to accept the default value in square brackets, or type in a new channel number and then press **Enter**.
The system will display confirmation, for example: `Channel: 8`
Note: The tuner channel must be between 2 and 69. If you enter a channel number that is lower than 2 or higher than 69, the system will display an "invalid channel" message and then return to the `Tuner Command >` prompt.

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This document provides installation and setup support only for the OAT100R. One or more VHF and/or UHF antennas must be installed before you proceed to set up the OAT100R. LG recommends that the system be professionally installed.

Check the following items before you begin OAT100R installation and setup procedures.

VHF and/or UHF Antennas

- Create a station plan for the OAT100R terrestrial input(s).
- Install the appropriate antenna(s) in accordance with the desired channels. The VHF and/or UHF antenna(s) must be located where it/they will have unobstructed access to the terrestrial signals. Amplify the antenna distribution as necessary.
- Point the antenna(s) so as to achieve the best signal quality (use appropriate equipment for measurement purposes).
- Up to eight 75 ohm RG-6 or larger coaxial cables from the terrestrial antenna distribution system should be available for connection to the OAT100R.
- Confirm that the installation environment meets the >17 dB specification for the OAT100R RF input signal-to-noise ratio.
- Measure the signal level at each of the OAT100R RF inputs. For proper system performance, the signal level at each RF input must be between +3 dBm (+52 dBmV) and -83 dBm (-34 dBmV). A nominal value of -53 dBm (-4 dBmV) is recommended. Note that additional equipment (i.e., attenuators) may be required to adjust the signal level.

OAT100R

- Unpack the OAT100R unit and all accessories.
- OAT100R Accessories:** • AC Power Cord and Adapter
- Select the location for mounting the OAT100R. Ensure that adequate ventilation is available.
 - Obtain the necessary attachment hardware to mount the OAT100R chassis in its targeted location.
 - Plan and install the necessary cabling and network (Ethernet) and AC power access for the OAT100R. You will also need the following to connect a PC directly to the OAT100R for system setup purposes: FTDI TTL-USB cable (P/N TTL-232R-5V-AJ).

Channel Assignments for RF Output

- Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the RF output of the OAT100R. Ensure that up to four contiguous CATV channels are allocated for the RF output. The OAT100R uses either a 256-QAM or 64-QAM modulation format, thereby occupying approximately 24 MHz of frequency spectrum.

The RF start channel is user-assigned during system setup, and the remaining channels are then automatically assigned per EIA-542 STD CATV frequency allocation standards. For example, if the RF start channel assignment is channel 2, the three remaining channels will be 3, 4, and 5. However, if the RF start channel assignment is 6, the three remaining channels will be 95, 96, and 97. Refer to EIA-542 STD CATV frequency allocation tables for further information as required.

The highest available RF channel number for the OAT100R is 135. Thus, to allocate all four channels available for OAT100R RF output, the RF start channel must be set no higher than 132.

- Find a location on the frequency spectrum that is free of existing noise.

Channel Assignments for IP Output

- The OAT100R outputs IPv4 multicast streams. Ensure the institution's IP network and room receivers support IPv4 multicast and that the network is capable of selectively routing multicast traffic. Refer to vendor equipment documentation for further information.

- Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the IP output of the OAT100R. Ensure that up to eight unused and unreserved IPv4 multicast addresses, within the designated range 224.0.0.0 to 239.255.255.255, are allocated for the OAT100R IP output.

IP channels are user-assigned during system setup. You may opt to specify an IP start channel and enable the system to auto-increment the remaining channel assignments. For example, if the IP start channel assignment is 227.0.0.40, the remaining channels will be 227.0.0.41, 227.0.0.42, etc. Or, you may opt to manually specify the IP details for each IP channel.

- Reserve at least one User Datagram Protocol (UDP) port for the multicast data streams. You can use the system default (1234) or another unassigned port number for each data stream, as required, for example, 50000, 50001, etc. The port(s) must avoid conflict with other protocols in use.

Note: Refer to the IANA IPv4 Multicast Address Space Registry and/or the IANA Service Name and Transport Protocol Port Number Registry for further IP address/port information as required.

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18. (64-QAM output only) Streams 1, 2, 3, and 4 are configured by default when 64-QAM output is used, though any four of the OAT100R tuners may be mapped to these streams. In the default system configuration, Tuner 1 is mapped to Stream 1, Tuner 2 is mapped to Stream 2, etc. If Tuners 5, 6, 7, and/or 8 are among the four tuners that were connected to the terrestrial antenna distribution system, make sure the tuners are mapped to the appropriate streams, as follows:

- a) If the `Command >` prompt is on display, type **tuner** and press **Enter** to access the Tuner Menu.

- b) At the `Enter Tuner number >` prompt, type the number of the first OAT100R RF IN port/tuner to configure. Then, press **Enter**.

The system will identify the current tuner and then display a Tuner Menu command prompt, for example:

`Current Tuner: Tuner-5`

- c) At the `Tuner Command >` prompt, type **output** and press **Enter**.

- d) At the `Enter output stream number (1-4 or 0 for no connection >` prompt, either press **Enter** to accept the default value in square brackets, or type the appropriate stream number and press **Enter** to remap the tuner output to a different stream.

The system will display confirmation, for example:

`Output stream remapped. Tuner is now streaming on output 1.`

- e) Repeat steps (c) and (d) for each of the additional three tuners, as required.

Note: Use the “tuner” command to access the Tuner Menu for each of the tuners in turn; i.e., at the `Tuner Command >` prompt, type **tuner** and press **Enter**. Then, at the `Enter Tuner number [#]>` prompt, type the number of the next OAT100R RF IN port/tuner and press **Enter**. The system will identify the (newly) current tuner and then display a tuner command prompt.

- f) When you are finished mapping the last tuner stream, at the `Tuner Command >` prompt, type **exit** and press **Enter** to return to the Main Menu `Command >` prompt.

19. (Optional) As part of the system setup, you will need to set tuner channel and program numbers. If you are not sure which RF channels and programs are available on each of the tuners, you may wish to run one or more RF scans before you set the channel and program numbers as described later in this procedure.

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16. (Required only if Pro:Idiom channels are present in the system) Check the Program PIDs field in the System Information display (if necessary, you can rerun the “info” command from either the `Command >` or `Setup Command >` prompt). If the default range (0x30 - 0x6f) is not appropriate for this system, set the PIDs as follows:
 - a) If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
 - b) At the `Setup Command >` prompt, type **pid** and press **Enter**. The system will display the current (default) PID configuration, followed by a prompt for the starting program PID:
Enter the starting program PID [0x30]:
 - c) Type the new starting program PID in hexadecimal format and then press **Enter**. (The system will auto-increment the remaining program PIDs.)
 - d) The system will display an overview of the new configuration and prompt for confirmation:
Do you want to save the new configuration? [y/n]:
Review the PID configuration to ensure it is correct, and then type **y** and press **Enter**. The system will confirm your update:
New configuration has been saved.
17. (Optional) If desired, you can identify the location in which the OAT100R is installed. The location description will be displayed as part of the System Information in the command line interface and as part of the System Status and Tuner Information screens in the GUI.
 - a) If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
 - b) At the `Setup Command >` prompt, type **location** and press **Enter**.
 - c) At the `Enter Location Description:` prompt, type a brief description of the location. Then, press **Enter**.
 - d) At the prompt for confirmation, type **y** and press **Enter** to set the location. The system will confirm your update:
Location description has been set.

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Packet Identifiers (PIDs)

Note: If Pro:Idiom channels are NOT present in the site’s entertainment system, PIDs do not need to be set in the OAT100R, and therefore, you will not need to design a PID map for the OAT100R output.

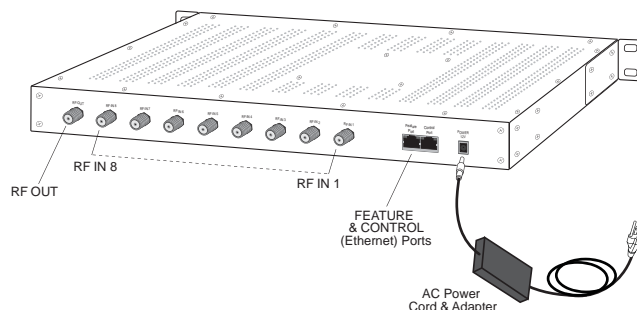
Note: See “Packet Identifiers (PIDs) Overview” in the extended Installation & Setup Guide for further information on PIDs.

- Survey the PIDs currently used in the system, and design a PID map for the OAT100R output (ensure that up to 64 PIDs are allocated). Ensure that Pro:Idiom message PIDs are never used by the video/audio PIDs for the OAT100R channels (or any other system elements).
The program start PID is user-assigned during system setup, and the 63 remaining PIDs are then automatically assigned within the 64-PID contiguous block.
- PIDs must be specified in the OAT100R system as hexadecimal numbers.

Refer to the **CodePlus OAT100R Off Air Transcoder System Installation & Setup Guide** for further installation and configuration information.

Product documentation is available online at: www.LGolutions.com.

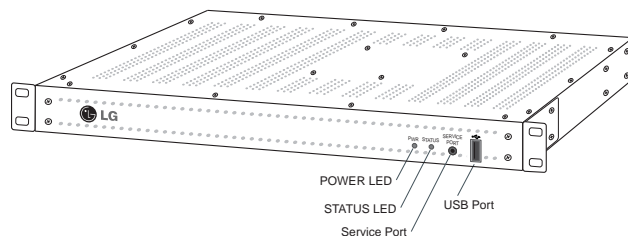
OAT100R Rear View



Disconnect Device

The AC mains plug is used as the disconnect device. The disconnect device must remain readily operable.

OAT100R Front View



Ventilation Holes

Air flow must not be obstructed. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the OAT100R. Do NOT stack other equipment on the top of the OAT100R.

(Continued from previous page)

- e) Once you have completed the output IP configuration as required, at the `IP Output Command >` prompt, type **apply** and press **Enter** to confirm and apply the configuration data to the system. Then, type **exit** and press **Enter** at the next `IP Output Command >` prompt to return to the Setup Menu prompt.
 - f) Connect a CAT5E or better cable between the Feature Port on the OAT100R rear panel and the institution's IP distribution network.
 - g) Continue with step 14.
14. (Optional) For remote management purposes, you can set a static IP address for the OAT100R Control Port as follows:
- a) If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
 - b) At the `Setup Command >` prompt, type **setip** and press **Enter**. The system will display current network configuration, followed by the Network Configuration Menu.
 - c) Use the Network Configuration Menu "ip" and "dns" commands and follow the system prompts to configure the Control Port. Refer to the extended Installation & Setup Guide for further information on the commands.
- Note:** Review the New Network Configuration overview carefully before you confirm the Control Port configuration settings. Ensure each of the addresses was entered correctly.
- Note:** If you change the Control Port configuration, you will be prompted to reset the system. If you intend to modify additional configuration settings during the current session, you may wait until all changes are complete before you reset the system.
15. Once all physical connections to the OAT100R have been made and the Control Port IP address has been assigned or configured, you also have the option to complete the system setup remotely using either the web GUI or the command line interface.
- To complete the system setup in the current session (via the Service Port), continue with step 16.
 - If you wish to complete the setup remotely, reset the system at this time: At either the `Command >` prompt or the `Setup Command >` prompt, type **reset** and press **Enter** (also confirm the reset when prompted to do so). When you are ready, establish remote communication with the OAT100R, and then continue with step 16. Note that you may use the GUI to perform the configuration steps, if desired. Refer to the extended Installation & Setup Guide for further information on establishing remote communication with the OAT100R and/or for further information on the GUI.

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- f) Connect RF OUT on the OAT100R rear panel to the RF distribution center combiner, and balance the RF signal so that the signal level at the TV(s) is between 0 to +7 dBmV.



Caution: For proper system performance, the OAT100R signal level at the TV input (ANTENNA IN) must be between 0 to +7 dBmV. Note that additional equipment (i.e., attenuators) may be required to adjust the signal level.

- g) Go to step 14.

13. (IP output only) Complete OAT100R IP output configuration as follows:

- a) If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
- b) At the `Setup Command >` prompt, type **ipout** and press **Enter** to access the IP Output Configuration Menu.
- c) The IP Output Configuration Menu offers two options for configuring output IP channels:
 - To manually configure the output IP channels, type **set** and press **Enter** at the `IP Output Command >` prompt. For each tuner, you will need to specify a multicast IP address and the multicast port number.
 - To auto-configure output IP channels from a base multicast IP address and port number, type **fill** and press **Enter** at the `IP Output Command >` prompt. Type the base multicast IP address and the multicast port number at the system prompts. The system will then auto-increment the remaining IP channels.

Refer to the extended Installation & Setup Guide for further information on these commands.

- d) (Optional) Use the IP Output Configuration Menu “ttl” command, as necessary, to set the multicast TTL, i.e., the number of hops allowed before the multicast data is dropped.

If a router is being used on the system, the TTL value should be the number of router hops + 1. If a router is not being used, leave the TTL set to 1 (default). Refer to the extended Installation & Setup Guide for further information on this command.

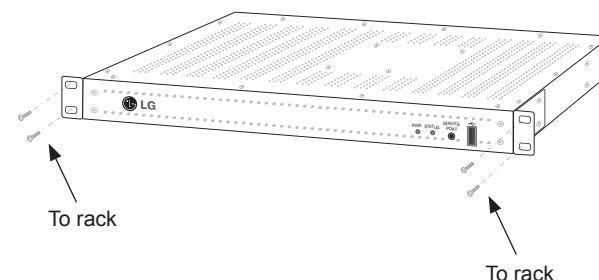
Note: The option to set the TTL is available only with OAT100R version 2.0 or later software.

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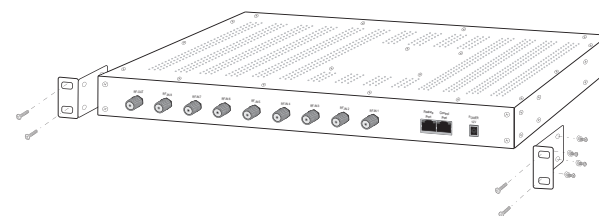
Typical Rack Installation

1. (Optional) As shipped, the OAT100R mounting brackets are attached flush with the front of the unit (see diagram a). If desired, the mounting brackets may be detached from the unit and reattached, for example, so that they are flush with the rear of the unit (see diagram b). If you wish to change the location/orientation of the mounting brackets, carefully remove each of the four (M4 x 10 mm) screws and attendant washers (one flat and one lock washer per screw) holding each bracket in place. Then, use the same screws and washers to reattach the mounting brackets in the desired location.
2. Carefully slide the chassis into a standard 19-inch equipment rack.
3. Use all four mounting screws to secure the chassis to the rack.

(a)

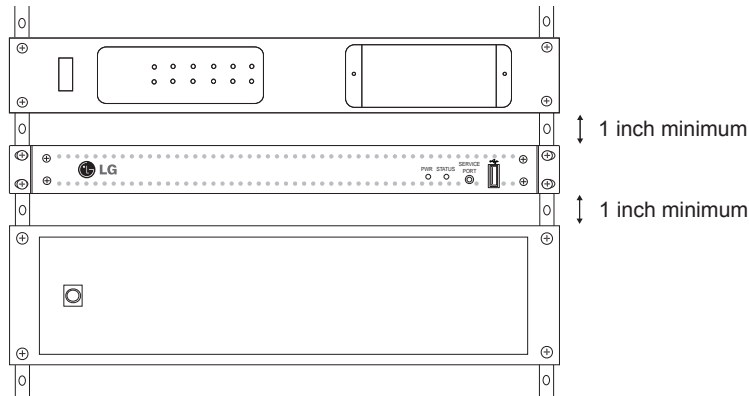


(b)



Use flat washer and lock washer with each M4 x 10 mounting bracket screw.

Front View
of Rack Cabinet



Rack-mount Considerations

A. Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer (see Specifications information in this document).

B. Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the OAT100R. Do NOT stack other equipment on the top of the OAT100R. Also, ensure that the unit's AC power adapter is never stacked or bundled with other AC power adapters. Each adapter should have adequate ventilation and should be isolated from other heat sources.

C. Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring.

D. Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

E. Mains Outlet Earthing

The apparatus with Class I construction must be connected to a mains socket outlet with a protective earthing connection.

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10. Check the Output field in the System Information display. If the default value (RF) does not identify the appropriate output type, set the output mode as follows:

- At the `Command >` prompt, type **setup** and press **Enter** to access the Setup Menu.
- At the `Setup Command >` prompt, type **omode** and press **Enter** to set the output mode. The system will display a list of the available output mode options (RF or IP), followed by a prompt for the new output mode:

```
Enter number of new output mode [1]>
```

- At the prompt, type the number that corresponds to the appropriate output mode and press **Enter**.

The system will confirm your selection, for example:

```
Output mode is set: IP
```

11. The next step depends on the output mode:

- If you are setting up the system for RF output, continue with step 12.
- If you are setting up the system for IP output, go to step 13.

12. (RF output only) Complete OAT100R RF output configuration as follows:

- If the `Command >` prompt is on display, type **setup** and press **Enter** to access the Setup Menu.
- At the `Setup Command >` prompt, type **rf** and press **Enter**. The system will display a list of RF mode options, followed by a prompt for a selection:

```
Select a new RF mode [2]:
```

- At the prompt, either press **Enter** to accept the default value in square brackets, or type the number that corresponds to the appropriate RF mode and press **Enter**.
- At the `Enter a new RF channel [2]:` prompt, either press **Enter** to accept the default value in square brackets, or type a new RF start channel number and then press **Enter**.

- At the `Enter number of channels [4]:` prompt, either press **Enter** to accept the default value in square brackets, or type the applicable number of channels (Maximum = 4) and then press **Enter**.

The system will display an overview of the settings, for example:

```
RF config:      Mode 2, 256-QAM-B, RF: 6 MHz, 5.36 MSps
RF channels:    7 8 9 10
```

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Note: After the system setup is complete, it is highly recommended that you use the “pwd” command, available from the OAT100R command line interface Setup Menu, to change the admin user password from its default value. Refer to the extended Installation & Setup Guide for further information.

8. At the Command > prompt, type **info** and press **Enter**. (You can press **Enter** at any OAT100R command prompt to view current menu, if desired.)

The initial System Information display identifies OAT100R default configuration settings, including the Control Port IP address, the PID configuration, and the output configuration, for example:

```
OAT100R
CodePlus Off Air Transcoder System
Copyright (c) 2010-2012 LG Electronics U.S.A., Inc.
Copyright (c) 2010-2012 Zenith Electronics LLC

SN:          201-12301011
Version      2.1
HW id:       12-19
Ctrl MAC:    00:0C:63:3A:FF:EC
Ctrl IP:     10.166.60.92
Program PIDs: 0x30 - 0x6f
Output:      RF
RF config:   Mode 2, 256-QAM-B, RF: 6 MHz, 5.36 MSps
RF channels: 2 3 4 5
Local time:  Tue Jan  8 14:42:02 CDT 2014
```

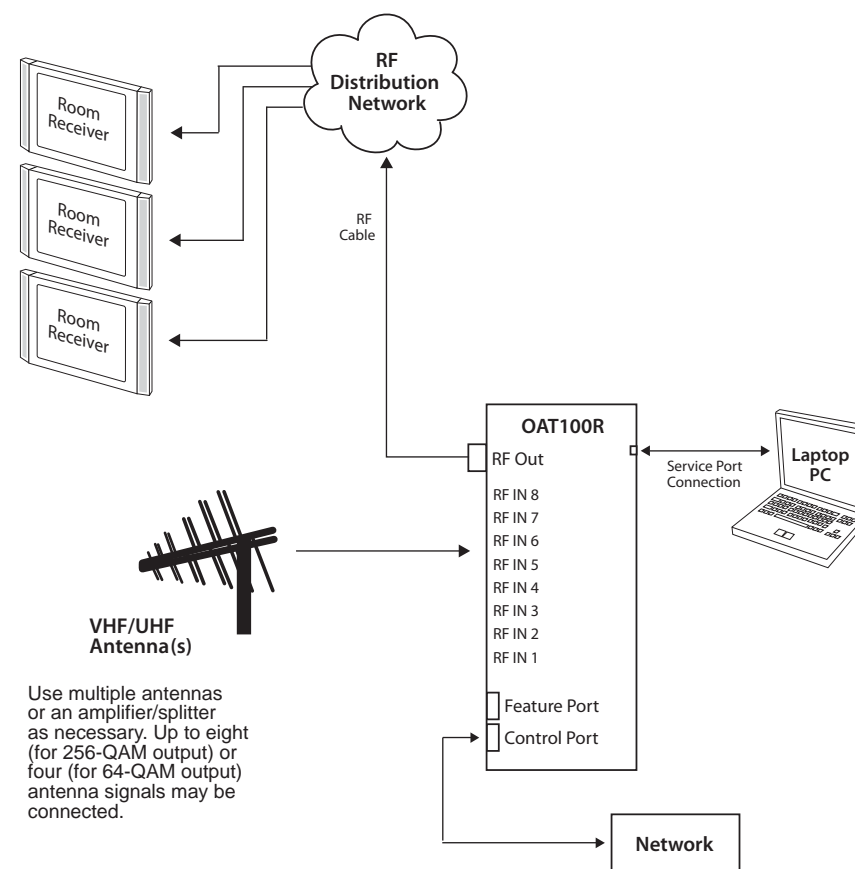
9. Check the Ctrl IP (Control Port IP address) field in the System Information display. By default, the OAT100R uses DHCP; thus, the DHCP server, if configured, assigns an IP address to the OAT100R once the OAT100R successfully connects to the network.
 - If the Ctrl IP field shows an IP address, the OAT100R is up and running on the network. Continue with step 10.
 - If the network is configured for DHCP but the Ctrl IP field is blank, refer to “Network Setup” troubleshooting information on page 25.
 - If the network is not configured for DHCP, you will need to configure a static IP address for the OAT100R. Complete steps 10 to 13 (as required), and then set the OAT100R IP address using the commands indicated in step 14.

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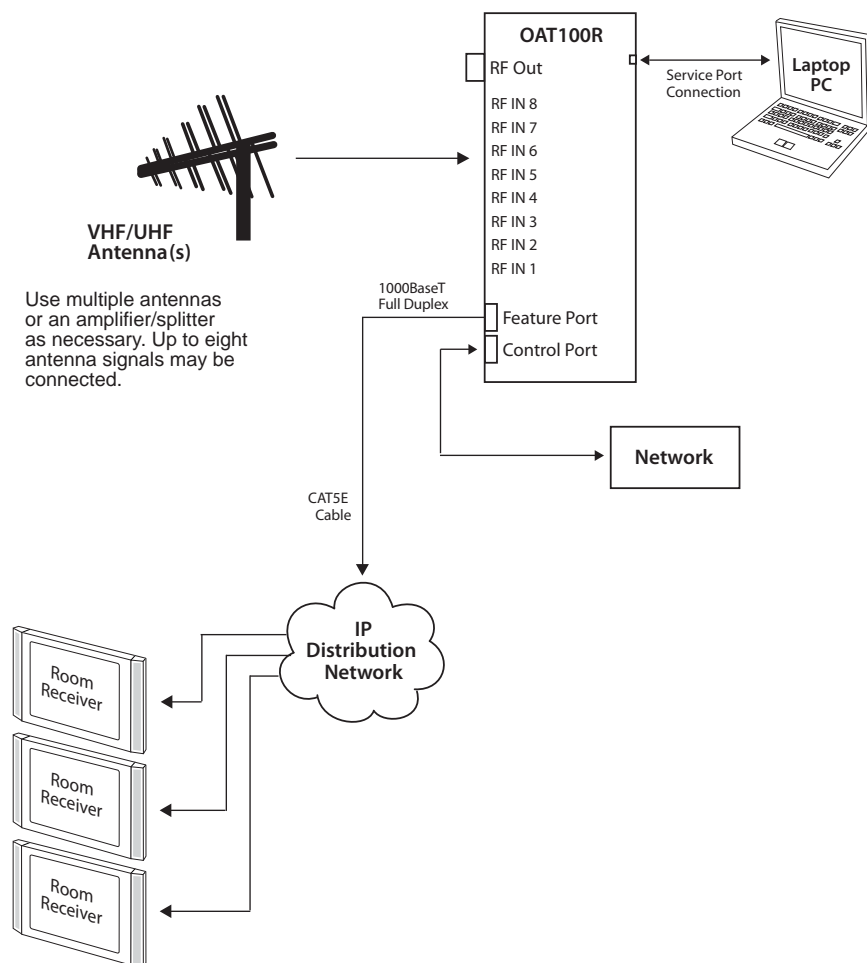
Refer to the following diagrams, and complete the system installation as described on pages 15 to 24.

Caution: Do NOT make system connections until instructed to do so during the system installation procedure. In some instances, configuration steps must be performed before physical connections are made.

Typical Setup Flow Chart for OAT100R with RF Output



Typical Setup Flow Chart for OAT100R with IP Output



Typical System Installation

(see also Typical Setup Flow Charts on the previous pages)

1. If not already done (see setup information on page 7),
 - Confirm that the installation environment meets the >17 dB specification for the OAT100R RF input signal-to-noise ratio.
 - Measure the signal level at each of the OAT100R RF inputs. For proper system performance, the signal level at each input must be between +3 dBm (+52 dBmV) and -83 dBm (-34 dBmV). A nominal value of -53 dBm (-4 dBmV) is recommended.
2. Connect a 75 ohm RG-6 or larger coaxial cable from the terrestrial antenna distribution system to each RF IN port to be used on the OAT100R rear panel. Up to eight OAT100R RF tuners may be connected for RF 256-QAM output or IP output; up to four OAT100R RF tuners may be connected for RF 64-QAM output.
3. To enable remote management, connect one end of a CAT5 RJ-45 Ethernet cable to the Control Port on the OAT100R rear panel, and connect the other end of the cable to the institution's network.



Caution: The subnet 192.168.0.x is reserved for internal communication and cannot be used for the Control Port network subnet. This is the only restriction; for example, you can use 192.168.1.x, 10.x.x.x, etc. Contact your service representative for further information.

4. Connect the OAT100R power supply to the POWER connector on the OAT100R rear panel. Then, plug the AC power cord into a powered AC line receptacle. When power is applied, the PWR (Power) LED on the OAT100R front panel will initially flash red and then turn green.
The boot-up process for the OAT100R may take up to two minutes. When boot-up is complete, the STATUS LED on the OAT100R front panel will light continuously green.
5. Once the STATUS LED is lit continuously (no longer blinking), use the FTDI TTL-232R-5V-AJ cable to connect a PC to the Service Port on the OAT100R front panel.
6. Using HyperTerminal or an equivalent terminal emulation program on the PC, configure the serial port as follows: Bits per second/baud = 115200; Data bits = 8; Parity = None; Stop bits = 1; Flow Control = None
Once the connection is established, you should see a login prompt. (If the login prompt is not automatically displayed, press **Enter** to refresh the screen.)
7. At the login as: prompt, type **admin** and press **Enter**. Then, at the password: prompt, type **Password4Partners** (case-sensitive) and press **Enter**.

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